

Unit Five

Summer Storms / Communication Challenges

Overview

In this unit, you will learn about the consequences of summer storms and how you can protect your farm and livestock against them. You will also work through a case that exemplifies communication failure, and learn about what you can do to communicate effectively in a disaster.

Objectives

Upon completion of this unit, you should be able to:

- List important consequences of summer storms on farms
- Identify mitigation and preparedness measures for summer storms
- List and define three components of effective communication
- Determine your vulnerability to summer storms
- Determine your vulnerability to communication failure in disasters

Thunderstorms

Approximately 100,000 thunderstorms develop in the U.S. every year. Of these, about 10 percent are severe and 3 percent, or 3,000, produce tornadoes.

Severe thunderstorms are characterized by:

- Sustained winds over 58 mph, or
- Hail greater than or equal to ¾-inch in diameter, or
- Development of tornadoes

Thunderstorm damage

Although the effect of thunderstorms is usually localized, storms occur so frequently that the total number of human deaths, injuries, and damages exceed the sum of all other disasters together. Summer storms have many consequences. Most damage is the result of flooding, lightning, wind, hail, and tornadoes.

Thunderstorm watches and warnings

Depending on where you live, summer storms can occur as early as February to as late as November.

The National Severe Storms Forecast Center in Kansas City, Missouri, issues severe thunderstorm watches. Local offices of the National Weather Service issue warnings and statements about severe weather and storms at the local level. The terms used are:

- A severe thunderstorm watch means that conditions are right for a storm to develop. When a thunderstorm watch is issued, you should take action to protect yourself and your farm.
- A severe thunderstorm warning means that severe thunderstorms have been sighted in your area and that the potential for danger is immediate. You should be prepared to take cover immediately.

Hazards

Sustained winds

Straight line winds can reach speeds of more than 100 mph and may be accompanied by heavy rains. Dust storms are another form of dangerous wind.

Tornadoes

Every state has recorded tornadoes in every month of the year and at most times of day and night. In the southern U.S., tornadoes occur most commonly from March to May. The summer months create conditions for tornadoes to occur more frequently in the northern states.

The greatest damage, injuries, and death during tornadoes occur from flying debris. Direct wind damage is the second major cause of destruction. Tornadoes are invariably accompanied by heavy rain and often by hail.

The National Severe Storms Forecast Center in Kansas City, MO, issues tornado watches. Local offices of the National Weather Service issue tornado warnings. Local officials may sound sirens in a tornado warning.

- A tornado watch indicates that conditions are right for a tornado to develop. When a tornado watch is issued, you should prepare to take cover.
- A tornado warning indicates a tornado has been sighted or is spotted on radar. Listen for local weather forecasts so that you know if you will be affected. You should be prepared to take cover immediately.

Hail

Hail damages crops, buildings, and equipment. It can be extremely dangerous for people and animals. Hail falls most commonly in Colorado and southern Wyoming. However, it has been recorded in every state across the country.

An easy guideline on whether severe damage has occurred to buildings, equipment, and livestock is to see if trees and plants have sustained damages. If they have been damaged, chances are high that roofs and equipment also have been damaged. In that case, you will want to be cautious when entering barns or other buildings.

Lightning

Lightning is another characteristic of thunderstorms. Lightning can strike several miles from the center of a storm. Therefore, people and animals can be struck by lightning even when it is not raining.

As a general rule, if you can hear thunder, you are at risk of being struck by lightning.

Lightning commonly strikes freestanding trees. Therefore, humans and animals should avoid taking shelter under freestanding trees when there is a risk of lightning strike.

What Can You Do?

Mitigation of thunderstorms

There are many things you can do to mitigate the consequences of thunderstorms. Here are some examples:

- Insure crops against storm damage loss through the Federal Crop Insurance Corporation of the U.S. Department of Agriculture.
- Buy flood insurance through your local property insurance agent (thunderstorms often cause flooding).
- Follow relevant building code practices such as wind-resistant design.
- Secure a source of electrical power, such as purchasing a generator.
- Build fences around single trees in pastures where livestock graze. The fences will prevent livestock from congregating under these trees in storms and reduce their risk of being struck by lightning.
- Fit barn windows with material that will not shatter and cut animals or people when broken by wind or hail.
- Fix loose siding and roofing and secure rafters in roofs.
- Store or secure any loose equipment and materials, including strapping.
- Label hazardous material tanks such as heating, oil, or propane.
- Securely tie manufactured (mobile) homes to a solid foundation or anchors to keep the wind from shifting them or turning them over.
- Plan to find shelter under heavy furniture or mattresses near an inside wall of your house on the ground floor.

Preparedness for thunderstorms

There are several steps that you can take to keep yourself, your farm, and your livestock safe during thunderstorms. The best preparedness is to develop a household and business plan and to practice this plan at least once a year. For example, conduct tornado drills with your family. Designate thunderstorm and tornado responsibilities among farm workers.

Regularly maintain generators and test your ability to operate your farm from electrical power supplies other than power grids.

When you observe signs of an impending storm, such as towering thunderhead clouds, darkening skies, lightning, and increasing winds, listen to the National Oceanic and Atmospheric Administration (NOAA) weather forecast, or a local radio or television station for the latest information.

Designate a safe area in or near your home to shelter your family and small animals in a severe thunderstorm. Teach family members and farm workers what to do in a storm if they are at home, at work, outside, or in a car, including how to relocate animals to safe locations.

If there is a risk of building collapse during a thunderstorm, livestock should be turned out to an open pasture to avoid injuries. However, animals should not be turned out if the risk of injury from flying debris is greater than staying inside. The ideal turnout is a low-lying area where animals can find natural protection.

Each farm should have a weather alert radio set to receive specific information about weather in its location.

Impact & Consequences

Summer storms can have many impacts and consequences. The following table presents some commonly reported problems that arise in summer storms and the unit where you can learn more about the consequences.

Impact	Consequence	Refer to Unit #
Storms can separate people and damage phone lines	Communications are challenged	This unit
Storms can blow over trees and cause power failure	Infrastructure failure	6
Lightning can start brush and structural fires	Threat to public and animal safety	7
Heavy rainfall can cause flooding	Need to evacuate people and animals	8
Heavy rainfall can cause mudslides	Displacement of animals	9
High-speed winds can cause hazardous materials to spill	Threat to public and animal health	10
Heavy rains can cause manure lagoons to overflow	Adverse effects on the natural environment and wildlife	11
Flying debris in tornadoes can kill animals	Need for carcass disposal	12
Animals can be injured from flying debris and electrocution	Need for euthanasia	13
Animals may be apprehensive or injured	Threat to the well-being of animals	14
Storms can distress farmers and their animals	Public concern	15

Effective Communication

In this unit we will look at a case of poor communication that took place during a summer storm. Poor communication is a common cause of confusion in disasters.

Effective communication is important in everyday life, and is critical during a disaster. In disasters you may have to make an accurate report on a situation to another person who cannot see the area affected or problem you have. Clear, unambiguous messages are essential. The important components of effective communication are:

- Clarity of the message
- Confirmation that the message has been sent and received
- Authentication of the source of information

In large-scale disasters, another problem arises when communications capacity is overwhelmed. Communications capacity becomes overwhelmed when people try to use phone lines or cell phone connections that are unavailable. Under these conditions, communication can be severely stressed, and often fails altogether.

Case 1: The manager's inquiry

Clarity of the message

It is summer in Wyoming. A crew of ranch workers saddle up their horses and go to repair fences. A storm develops in the afternoon. The ranch manager, who stayed at the ranch house, notices lightning in the direction where the fencing crew is working. The manager calls the workers on his cell phone and the following conversation takes place.

Manager: *“I saw a storm coming your way and wanted to know if everything is all right.”*

Workers: *“Everything is as good as could be expected out here.”*

At that point there is a loud clap of thunder and the communication is broken off.

Was the communication unambiguous?

The communication between the fencing crew and ranch manager was ambiguous. Let's review why the message was not clearly conveyed.

The inquiry of the manager could have meant:

- How is the fencing work progressing?
- Are you safe?
- Is the storm affecting you?
- Do you need help?

Unfortunately, we cannot satisfactorily answer any of these questions because the communication was ambiguous.

Likewise, do we know what is meant by the response? Not exactly, because the reply could have meant one of the following:

- The fencing work is proceeding nicely.
- We have been struck by lightning, but nobody is injured.
- We need help, but assume that you have other things to be concerned about.

Admittedly, this conversation was cut short and may have been clearer if it had continued.

How good are your disaster communication skills?

Now, let's think about how the communication could have been less ambiguous. Imagine yourself as the ranch manager. As you see the storm brewing, you are most concerned about the safety of your workers and would like to know if they or their horses need protection from the storm.

Compare the following two questions and determine which one is clear.

1. Do you need protection from the storm?
2. Do you need help?

The first sentence is clear; however, the second question is ambiguous because it could mean: do you need help because you are injured, because a horse has bolted, or with the fencing work?

Case 2: Power outage

Let's continue our case. The storm continues to develop and passes over the ranch with straight line winds and hail, followed by heavy rain.

Once the storm has passed, the ranch manager checks on his family and horses. Having confirmed that all are safe, he now wants to know if the fencing crew is safe. He calls them again. Several attempts have the same result. The phone rings and someone picks up, but he cannot hear what the person is saying.

Sending, receiving, and acknowledging a message

What do you think is the problem? Could the message not have been sent and received, or is it being sent and received and the manager is simply not getting an acknowledgement?

What would you do in this situation? How could you confirm that your message has been sent, received, and acknowledged?

To determine if his phone is working, the rancher called his neighbor. There was no response to his first call, so he tried another neighbor. This neighbor was at home and responded, but told him that the power was out in some areas and he had heard a telecommunications tower had been struck by lightning.

Growing more anxious, the rancher drove to where he thought the fencing crew would have been working at the time of the storm. A large tree has fallen close to where his crew had been working.

Unsure of where the crew might be, the rancher blew the horn of his truck a few times and waited for about 30 minutes. As there was still no sign of the crew, he decided to return to the ranch.

How good are your disaster communication skills?

Imagine yourself in the circumstances of the fencing crew.

What could you have done better to acknowledge the rancher's message?

For example, before leaving you could leave a conspicuous sign or message indicating that you were safe and where you had gone.

Message authentication

Upon returning to the ranch, the farm manager noticed a message on his telephone answering machine. Unfortunately, he could not recognize the voice because it cut off early, but he thought it was Jeff, one of the fencing crew. He thought the message said that Jeff was cold and in need of help.

To find out, he telephoned Jeff's home. Jeff's wife answered the phone. She had not seen or heard from Jeff since he left for work that morning. However, she had just returned home from work herself, i.e., she could not authenticate the message either. She became concerned about Jeff.

How good are your disaster communication skills?

How would you authenticate that this message was from Jeff and what the content of his message was? Here are some suggestions:

- Use caller ID
- Use the return call function
- Play back the message to somebody else who knows Jeff
- Ask the operator if the call can be traced

Review

The ranch manager explained all that happened to Jeff's wife:

- The initial communication was not clear and got cut off
- He was uncertain whether his message had been sent or received
- There was no acknowledgement
- And now, he was unable to verify whether the message was authentic

At that moment Jeff walked in. He was well and had been in the yard when his wife arrived. He said, *"What a day! Every time we tried to communicate, something went wrong. We need to think about how we can improve our communication for future disasters."*

What Can You Do?

Use clear and unambiguous language

To help minimize confusion during a disaster, use clear and unambiguous communication. Clear communication is a skill that can be learned, but also one that has to be practiced.

Avoid jargon and terms that could be misunderstood. Do not use “10-codes,” because the codes are often not understood, or mean different things to different people. Also, radio communication jargon, such as “Roger,” “Over and out,” should be avoided, because when communication is tenuous, these words can be mistaken for other words.

Confirm that a message has been sent/received

If you use a telephone, you can usually tell if it is working from the sound it makes. If the sounds are normal, and you cannot get through on a local call, make a phone call to a friend or family member out of your area. It is often easier to phone out of a disaster-struck area than to call into one or within one.

When you call your out-of-the-area contact, you accomplish two things: you test your phone system and contact your friends and family, who may have heard about a disaster in your area and want to know if you have been affected. It is advisable for all family members to have the same out-of-area contact number. That way, the out-of-area contact person can relay information if local communication fails.

Other ways in which you could ensure that your message is being sent or received include using alternative / backup communication (two-way radios, cell phone). Alternative methods of communication include blowing a horn or using flares.

Confirm that your message has been acknowledged

If you cannot use or depend on the familiar channels of communication, visible signs that spell out needs or conditions are useful. The use of “Help” or “OK” signs that are visible from the road or the air are a simple, effective method of advising others of your status.

Other methods of improving communications in disasters

Especially in large-scale disasters, communication systems can be overwhelmed. “Buddy Systems” and telephone trees can increase communications in disasters.

A Buddy System is where neighbors and friends determine ahead of time who will be responsible for checking on whom and who has what resources that may need to be shared.

A Telephone Tree is where people in an affected area call each other as follows: the first person calls two other people to see if they need help and to request that they, in turn, phone two others, and so forth. Telephone trees should be tested periodically. A meaningful time to do this is before the summer storm season approaches.

When calling on a radio, always call the party’s name you are trying to reach first, then identify yourself by name. For example, “Jeff, is that you? This is Mary.”

Ask specific questions that require specific answers, such as “What is your location?” Wait for a reply to each question before asking the next. If there is no reply, repeat the question.

When calling with a cell phone, ensure first that you have a good and reliable connection. If necessary, seek out a location, such as a hilltop or other elevated spot, where the connection is good. If you are driving and have to use a cell phone, stop the car before conversing.

Plan for multiple methods of communication in case one fails.

Authenticating messages

Authenticating the source of information in disasters is very important, because often decisions are made based on information received from people within the affected areas, commonly referred to as “the field”. During large-scale disasters, emergency management officials frequently get calls from people they do not know, but who have information that may be important. For officials to be able to use this information, they have to know the source and dependability of the person providing the information.

Therefore, livestock producers should be able to act as reliable sources of information in disasters, should contact their local emergency management officials and establish a working relationship before disaster strikes. It is important to remember that the responsibility and initiative to care for animals resides with the animals’ owner, not with emergency management.

Assess Your Vulnerability

Summer Storms	
Item	Vulnerability Score
1. Based on your historical knowledge of local conditions, how commonly are farms within your county affected by severe summer storms? 1 (rarely)—5 (several times a year)	
2. If you were struck by a severe storm, based on the resources you have available to you, how much of an impact would the storm have on your farm operations? 1 (minor)—5 (severe disruption)	
3. What is your vulnerability to summer storms? Add 1 and 2	Enter this number on page 16-3
Communication Challenges	
Item	Vulnerability Score
1. If you were the farm manager in the case above, how well do you think you would have communicated? 1 (excellent performance)—5 (poor performance)	
2. How severely would your farm or county be affected if you were not able to communicate with other people on and off the farm or county? 1 (not critical)—5 (severely affected)	
3. What is your vulnerability to this consequence? Add 1 and 2	Enter this number on page 16-5



Learning Check

Directions: Determine if the following statements are true or false based on the material in this unit. When you have finished, check your answers on page 5-17.

1. Sustained winds of more than 58 mph and hail greater than or equal to $\frac{3}{4}$ -inch in diameter are two characteristics of severe thunderstorms.
True or False?

2. Local Weather Service offices issue storm warnings.
True or False?

3. It must be raining for a person or animal to be struck by lightning.
True or False?

4. Thunderstorms and their consequences are probably the single greatest cause of human death and injuries due to natural disasters in the United States.
True or False?

5. To help minimize confusion during a disaster, use ambiguous language.
True or False?

6. Flying debris is the most common cause of injury to people and animals in tornadoes.
True or False?



Learning Check

7. If hail has destroyed trees, it is also likely that buildings have been damaged.
True or False?

8. Crop insurance is important mitigation to protect against the effects of summer storms.
True or False?

9. Erecting fences around freestanding trees effectively reduces the risk of lightning strike in livestock.
True or False?

10. To prevent shifting in high winds, manufactured (mobile) homes should be tied down.
True or False?

11. Developing and rehearsing a family disaster plan is an effective preparedness activity for summer storms.
True or False?

12. Emergency management officials are likely to use information from a disaster-struck area only if they can authenticate the source of information.
True or False?



Learning Check

13. The components of effective communications are sending, receiving, and acknowledging.

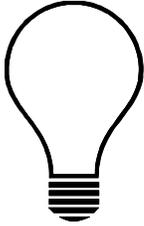
True or False?

14. Verifying the source of information is important for decision making in disasters.

True or False?

15. A local contact is the most effective way to relay messages in a disaster.

True or False?



Answers

For every question that you answered incorrectly, review the page listed next to the answer to find out why your answer was incorrect.

1. True..... 5-1
2. True.....5-2
3. False.....5-3
4. True.....5-2
5. False.....5-7
6. True.....5-2
7. True.....5-3
8. True.....5-4
9. True.....5-3
10. True.....5-4
11. True.....5-4
12. True.....5-12
13. True.....5-11
14. True.....5-12
15. False.....5-11

Summary

This unit described the major effects of summer storms and made recommendations on mitigation and preparedness. This unit also described the importance of communications in disasters and ways to communicate effectively.